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tation. Possibly also when reductions of the photographic measures have been made with every possible refinement, some outstanding effect may be disclosed to be referred to optical refraction in the sun's atmosphere, especially for stars in the polar regions like Nos. 3, 4, 6 and 10, where the length of the light path through the solar atmosphere would be considerably less than for stars 2, 5 and 11, in the equatorial regions (*cf.* § 5c).

A future communication will give further consideration to this matter.

8. In the foregoing paragraph nothing has been said as to the possibility of irregularities in the differential refraction effects in the earth's atmosphere such as have been disclosed by various investigators and which may not have affected every ray alike over a star field embracing about two degrees of arc. In brief, the actual differential terrestrial refraction effects, because of atmospheric conditions during totality of the eclipse or during the times when the check-plates were exposed, or because of the manner of mounting of the instrumental appliances, may have been appreciably different from those derived from mathematical formulæ and standard refraction tables. It would seem that in future tests of the Einstein effect, atmospheric-refraction observations and allied meteorological observations should be included as a necessary part of the program of work.

L. A. BAUER

DEPARTMENT OF TERRESTRIAL MAGNETISM,  
WASHINGTON, D. C.,  
May 11, 1920

#### FOURTH YEAR OF THE NEOTROPICAL RESEARCH STATION

THE work of the New York Zoological Society Station in British Guiana began in 1916. Owing to the difficulty of transportation at the time of the war, there was a lapse during 1917, but work was resumed in 1918 and 1919. The station is now entering its fourth year. It has been directed with great ability by Mr. William Beebe, Honorary Curator of Birds at the Zoological Park, and

has been supported by personal contributions of the trustees of the Zoological Society.

The distinctive research feature of this station is intensive biologic observation in one region, in fact, in one locality, as distinguished from the observations of Darwin, Bates, Waterton, Chapman, and many other explorers in the great biologic field of South America. The area chosen by Director Beebe is the eastern edge of the tropical rain-forest of South America, which extends unbroken across the greater part of the continent. The fauna and flora are uniform with those of the entire Amazonian region. The locality in Bartica District, British Guiana, at Kartabo, the point of junction of the Mazaruni and Cuyuni rivers, has proved ideal in every way as a permanent site for this station. Within ten minutes walk are sandy and rocky beaches, mangroves, grassland, swamp, and high jungle, each with a growth of life peculiar to itself. Free exposure to the trade winds, the absence of flies and mosquitos, invariably cool nights, excellent buildings assigned by the government—all these features contribute to the wide range of life and the unbroken health of the scientific staff.

This region affords a vast opportunity for studying the faunal and floral complex, independent and interrelated adaptations in all grades of life in vertical as well as horizontal life zones. The vertical division of the fauna and flora in distinctive zones, extending from the tree summits to the subsoil, is a biologic contribution of importance. The observations of the station extend from color changes and adaptations to anatomical and functional characters of the archaic as well as of the highly modernized forms of life.

All together seventy-five papers have been published on the scientific observations of this station, parts of which have already been reviewed in the volume "Tropical Wild Life" issued by the society in 1917. Three papers appeared in the first volume of *Zoologica* (1907-1915), and it has been decided to reserve the third volume of *Zoologica* exclusively to scientific papers on the station.

During the year 1919 Director Beebe's

work dealt chiefly with environmental problems and evanescent characters such as color, pattern, tissue form, developmental change and habits of the higher vertebrates. Elaborate studies were made of the eyes of reptiles and amphibians, also of the tongue, tarsus, and hyoid apparatus of three families of birds, the Formicariidæ, Cotingidæ, and Tyrannidæ, and the syringes of one hundred and twenty-two species of birds. The general notes on life histories of amphibians, reptiles, and birds were greatly increased and will shortly be ready for publication. Among the lower forms, six specimens of *Peripatus* were studied, one of which gave birth to eight young.

Without in any way interfering with the scientific work of the station it was found possible to collect and preserve for the American Museum a collection of two hundred and seven mammals, skins, skulls and skeletons, with full data, comprising about forty-three species. Among these was a series of thirteen red howling monkeys of various ages, part of which has been introduced in one of the groups in the Primates Hall of the American Museum. Every reptile and amphibian, excepting those involved in research problems, was preserved, a collection of two hundred being brought north to the American Museum. To aid current research on the Crocodilia, a series of crocodile skulls was sent north. Similarly a number of large electric eels was collected for Professor Ulric Dahlgren, of Princeton, and embryos of the red howling monkey were sent to Dr. Adolph H. Schultz, of Johns Hopkins University.

Mr. John Tee-Van, of the New York Zoological Park, in addition to the economic administration of the station, made five hundred pen and ink drawings of the syringes and tongues of birds, considered to be of great importance in classification. Mr. Alfred Emerson, of Cornell University, chose the Termites as his object of research and completed his biologic studies on fifty-six species. Professor Albert M. Reese, of the University of West Virginia, began a microscopic study of the swamp and river fauna, and an in-

tensive environmental investigation of a hundred yards of sandy beach in front of the laboratory. His chief research was on the embryology of the crocodile, obtaining embryos of all stages. Mr. Clifford Pope, of the University of Virginia, worked on the fish life near the station and obtained valuable data on thirty-five species. Miss Isabel Cooper, of Bryn Mawr, made two hundred and forty-five paintings and drawings, in full color, of fishes, amphibians, reptiles, and invertebrates, most of them known heretofore only from colorless alcoholic specimens. Among the most interesting paintings are those of the living eye of amphibians and reptiles.

In the year 1919 the station was open from March first until October. Director Beebe and six associates and assistants are leaving New York May 8, 1920, for the fourth season's work.

#### SEASON OF 1920

The party leaving New York on May 8 for the fourth season includes William Beebe, director; John Tee-Van, scientific assistant and preparator; George Inness Hartley and Alfred Emerson, research associates; Clifford Pope, research assistant; Isabel Cooper and Anna Taylor, artists.

In addition to the continuation of the regular research work of the station of previous years, as outlined in the above report, there will be special studies on the habits of the hoactzins and the army ants, with the new Akeley moving picture camera. Attempts will be made to secure living giant armadillos and hoactizins for the Zoological Park of New York.

Professor Ulric Dahlgren, of Princeton, will visit the Neotropical Station in August to begin his researches on the electric eel *Gymnotus*. Professor William Morton Wheeler, of the Bussey Institution, with his son Mr. Ralph Wheeler, accompanied by Professor J. C. Bailey, will visit the station in July to study the ant fauna. Dr. Casey Wood, one of the leading authorities on the fundus oculi of the sauropsids and amphibians, expects to visit the station later in the year accompanied

by Dr. Harold Gifford. Four artists will be at the station during the present year and will devote especial attention to recording the coloring of creatures too delicate to bear transportation alive to a temperate zone.

Among the incidental results of the work of the station is a rich and continuous supply of living animals to the New York Zoological Park, including such animals as the jaguar, ocelot, capybara, agouti, anaconda, and jabiru. This season a very much larger collection of living animals will be made and sent north.

HENRY FAIRFIELD OSBORN

PRESIDENT OF THE NEW YORK

ZOOLOGICAL SOCIETY,

May 6, 1920

### SCIENTIFIC EVENTS

#### COLLECTIONS OF THE NATIONAL MUSEUM

THE annual report of the director of the U. S. National Museum states that the total number of specimens acquired by the museum during the year was approximately 526,845. Received in 1,198 separate accessions, they were classified and assigned as follows: Department of anthropology, 12,333; zoology, 442,383; botany, 40,357; geology and mineralogy, 4,750; paleontology, 26,050; textiles, woods, medicines, foods, and other miscellaneous animal and vegetable products, 884; mineral technology, 62; and National Gallery of Art, 26. As loans for exhibition, 3,096 articles were also obtained, mainly for the divisions of history and American archeology and the Gallery of Art.

Material to the extent of 539 lots was received for special examination and report.

The distribution of duplicates, mainly to schools and colleges for educational purposes, aggregated 3,441 specimens, of which 1,378 were contained in seven regular sets of fossil invertebrates averaging 47 specimens each and six regular sets of mollusks of 174 specimens each. The balance comprised 19 special lots, consisting of marine invertebrates, reptiles, fishes, fossils, minerals and ores, stone implements, and basketry specimens.

In making exchanges for additions to the

collections, a total of 5,227 duplicate specimens were distributed. These consisted largely of plants.

Material sent out to specialists for study on behalf of the Museum amounted to 19,851 specimens, mainly biological.

In furtherance of its extensive historical exhibits, the Museum, early in the year, through cooperation with the War and Navy Departments, undertook the assembling and installation of a collection of materials connected with the World War, which may ultimately, require a separate building.

#### APPROPRIATIONS FROM THE HENRY DRAPER FUND OF THE NATIONAL ACADEMY OF SCIENCES

At its recent meeting the National Academy of Sciences made the following appropriations on the recommendation of the committee on the Henry Draper Fund:

\$400 to S. A. Mitchell, of the University of Virginia, to complete the purchase of a measuring microscope for use in the photographic determination of stellar parallaxes, on the basis of observations made with the 27-inch refracting telescope. The academy awarded the sum of \$250 from the Draper Fund to apply on the purchase of this instrument and the proposed grant of \$400 will complete the purchase. The microscope, costing \$650, becomes in effect the property of the academy. Professor Mitchell will devote an equivalent sum, \$400, to other needs of his parallax research.

\$300 to Joel Stebbins, professor of astronomy in the University of Illinois, to assist in the further development of the photo-electric-cell photometer.

\$400 to Frank Schlesinger, director of the Allegheny Observatory, to enable him to test an automatic zenith camera for the determination of terrestrial latitude, with the expectation that the results will be more accurate than any hitherto obtained by other means. It is proposed that this instrument be mounted temporarily at the International Latitude Observatory at Ukiah, California, where the astronomer in charge will operate it for a year or two as a labor of love. The grant is needed to install the instrument at Ukiah and to make certain auxiliary apparatus required in its operation. The Allegheny Observatory is loaning the objective and the photographic plates obtained will be measured by Dr. Schlesinger himself or under his immediate direction.